Elements and Compounds

1. **Elements** are found in the **Periodic Table.** All elements can be shown as a **symbol.** Complete the following table**.**

Name of Element	Symbol
Hydrogen	
Sodium	
	Ca
	S
	He
Iron	
Chlorine	
	Mg
Zinc	
	Au
Potassium	

2. Colour in or highlight the elements that are **metals** in the table above**.**
3. **Describe** what a compound is.

4. Fill in the missing details in the table below.

Name of Compound	Formula	What atoms are found in the compound?
Zinc oxide	ZnO	1 zinc, 1 oxygen
Magnesium oxide		1 magnesium, 1 oxygen
Sodium chloride	NaCl	
	CO_2	1 carbon, 2 oxygens
		2 Aluminium, 3 sulfurs
Potassium nitrate		1 potassium, 1 nitrogen, 3 oxygens
Copper sulphate	$CuSO_4$	
	PbO	

5. What elements would you **react** together to make the compound **iron oxide?** ..... and ……..

6. **Identify** the following substances as either a mixture or a compound.

    a. Carbon dioxide
    b. Air
    c. Water
    d. Salty water
    e. Soil
    f. Bronze
    g. Copper oxide
    h. Table salt

7. **<u>Groups and Periods of the Periodic Table</u>**

Elements are arranged in rows and columns in the periodic table in order of increasing atomic mass. The vertical columns are called **_____** and the horizontal rows are called **_____**. Li, ____ and K are in the same group while N, ____ , F are in the same period. Elements in the same groups have similar _____ and physical properties

8. **<u>Elements in Group 17 (halogens)</u>**

Write down the names or symbols of the first 5 elements in Group 17

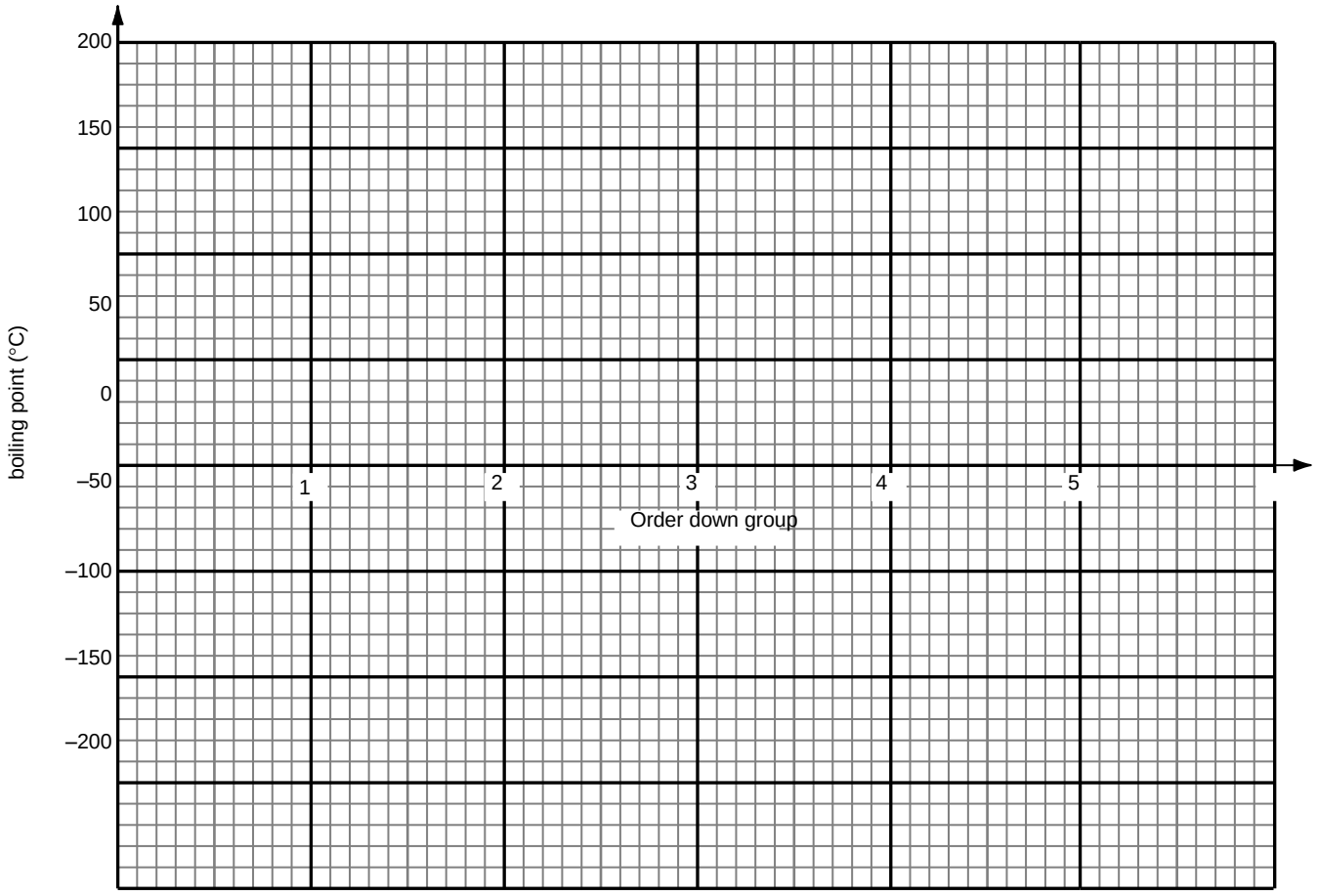
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____

9. **Trends in Group 17 – The Halogens**

Look at the table below:

halogen	Order down group 17	boiling point (°C)
fluorine	1	–188
chlorine	2	–34
bromine	3	58
iodine	4	184

Plot this information as a bar graph below:



Questions

a) What is the pattern of the boiling point going down Group 17?

b) Which halogens are gases at room temperature (25 °C)?

c) Astatine is below iodine in Group 17. Predict the boiling point of astatine using your graph as a guide. Now research what the actual boiling point of astatine is. How close was your prediction?

10. **Elements in Group 18 (noble gases)**

a) Another name for noble gases is inert gases. What does **inert** mean and why are group 18 elements given this name?

_____

b) Write down the names or symbols of the first 5 elements in group 18.

a) _____

2. _____

3. _____

4. _____

5. _____

11. **Solid, Liquid, Gas Comprehension**

Solids stay in one place. They do not _____. Solids are often _____. The _____ of an object is the amount of space it takes up. Solids cannot be _____ – their volume can't be _____.

Liquids cannot be moved in a flow. Liquids are carried in 

truck like solids can because they _____ and can be pumped. The _____ of a liquid cannot be changed – liquids can't be squashed.

Gases are normally transported in cylinders. Gases flow very _____ and _____ out to _____ the container they are in. Gases _____ have a fixed volume. A gas can be squashed to fit in a smaller container. Gases are less dense than _____ and _____.

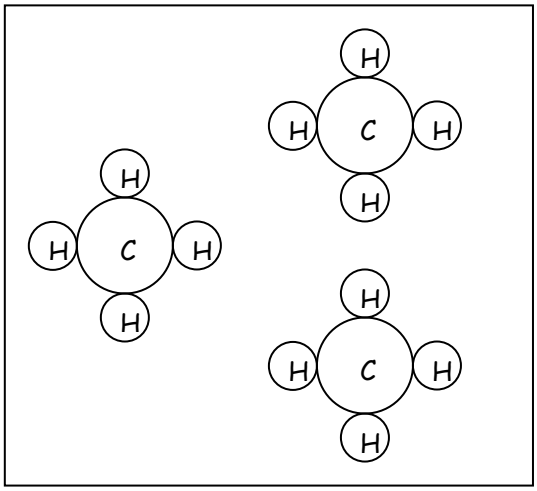
Word to use: changed dense don't easily fill flow liquids solids spread squashed tankers volume

12. Fill in the missing words in the definitions below.

Missing words: **elements, different, one, joined, atom, type, two**

- An **element** consists of _____ _____ of _____.
- A **compound** contains _____ or more _____ _____ joined together.
- A **mixture** contains two or more _____, but they are not chemically _____.

13. Using the definitions, decide whether the following diagrams represent an element, a compound, or a mixture. Explain your choice.



a) This diagram shows an

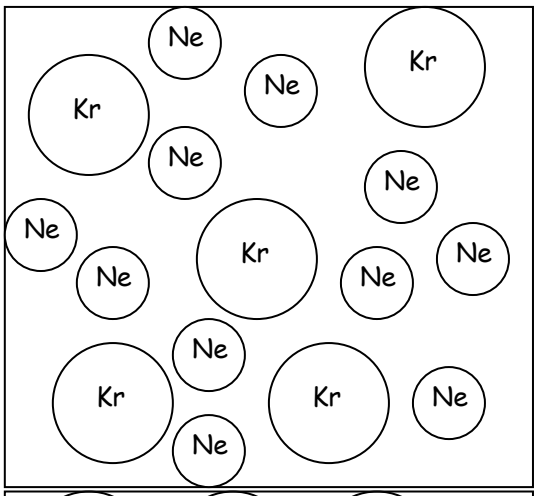
_____.

I think this because:

_____

_____

_____



b) This diagram shows an

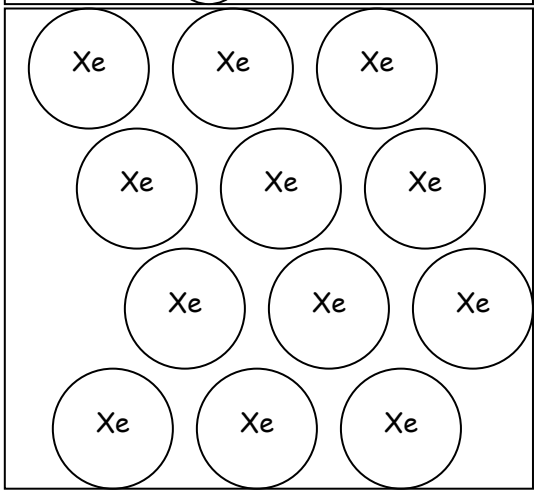
_____.

I think this because:

_____

_____

_____



c) This diagram shows an

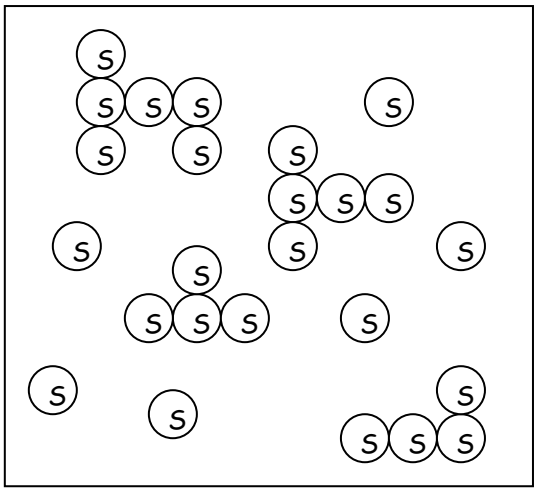
_____.

I think this because:

_____

_____

_____



d) This diagram shows an

_____.

I think this because:

_____

_____

_____

14. According to our definition above, H_2O (water) is a compound. However, it is sometimes called a **molecule**. O_2 (oxygen gas) is also a **molecule**. Can you think of a way to define a **molecule?**

A _____ consists of _____ or more _____ chemically

_____ together. These _____ can be of the same _____ or

different elements.

15. Tick the box if the stated property applies to a solid, liquid and/or gas

Property	**Solid**	**Liquid**	**Gas**
It will mould its shape to its container			
It will spread out on a surface			
It will hold its shape unless broken			
It does not flow			
It can be compressed			
Its particles are free to move past each other			
There is lots of space between each particle			
Its particles are in contact with one another			
It can flow			
Its particles are not in contact with one another			
Its particles cannot move past each other			
There is little space in-between each particle			

16. In diagram 1 box, draw how the particles appear in a solid. In the Explanation box, describe how the particles are behaving. Repeat this for a liquid in diagram 2 and a gas in diagram 3.

Diagram 1

Explanation...

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Diagram 2

Explanation...

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Diagram 3

Explanation...

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17.

a) The melting point is the temperature at which a substance changes from a _____ to a _____

b) The boiling point is the temperature at which a substance changes from a _____ to a _____

c) Water melts at _____°C and boils at _____°C

18. What is the physical state of water at these temperatures?

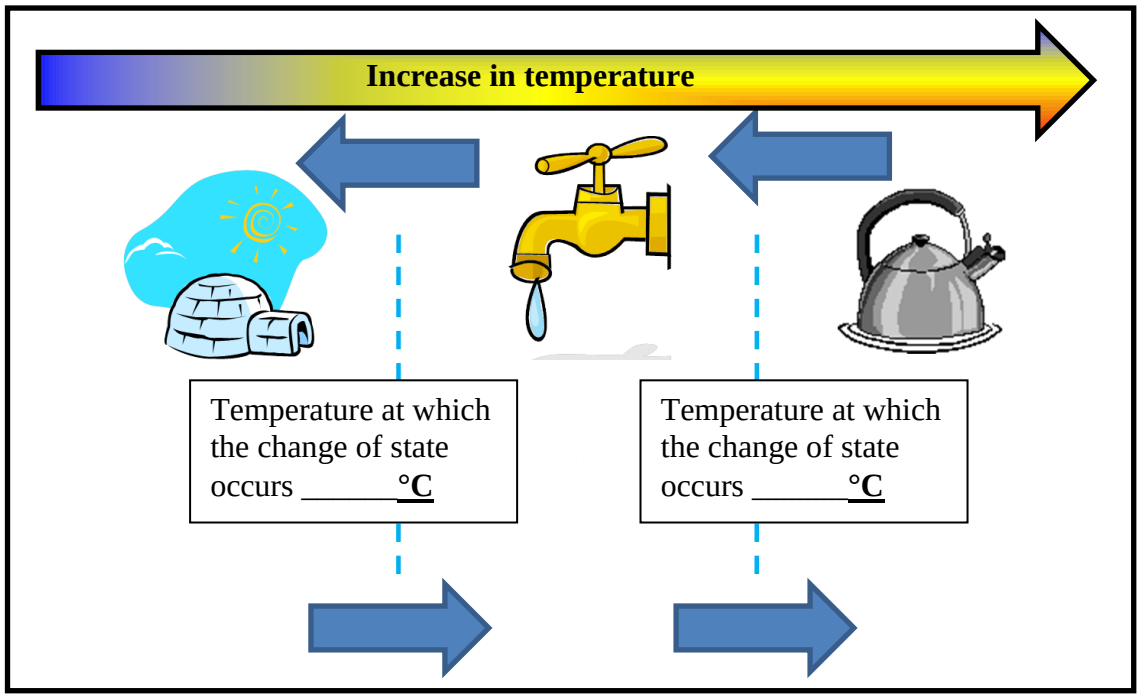
45 °C = _____

125 °C = _____

-24 °C = _____

75 °C = _____

19. Label each of the 3 pictures with the correct state of matter
Label each of the arrows with the name of the change in state



20. Using the information provided in the table, fill in the final column.

Element	Melting point (°C)	Boiling Point (°C)	State at room temperature (25°C) ?
Chlorine	-101	-34	
Iodine	114	184	
Fluorine	-220	-188	
Bromine	-7	59	

21. Describe what happens to the kinetic and potential energy of the particles in a block of ice as it melts.

22. Describe what happens to the kinetic and potential energy of cold water particles as the water warms up.